WHAT IS CLAIMED IS:

1. A biointerface membrane suitable for implantation in a soft tissue of an animal, the membrane comprising:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the interconnected cavities are greater than or equal to about 90 microns in at least one dimension; and

a second domain, wherein the second domain allows passage of an analyte, and wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes.

2. The biointerface membrane according to claim 1, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

3. The biointerface membrane according to claim 1, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

4. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

5. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

6. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

7. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

8. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

9. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

10. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

11. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

12. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

13. The biointerface membrane according to claim 1, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

14. The biointerface membrane according to claim 1, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

15. The biointerface membrane according to claim 1, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

16. The biointerface membrane according to claim 1, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

17. The biointerface membrane according to claim 1, wherein the solid portion comprises silicone.

18. The biointerface membrane according to claim 1, wherein the solid portion comprises polyurethane.

19. The biointerface membrane according to claim 1, wherein the solid portion comprises a block copolymer.

20. The biointerface membrane according to claim 1, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

21. The biointerface membrane according to claim 1, wherein the second domain comprises a biostable material.

22. The biointerface membrane according to claim 21, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

23. The biointerface membrane according to claim 21, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

24. The biointerface membrane according to claim 1, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

25. The biointerface membrane according to claim 24, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

26. The biointerface membrane according to claim 25, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

27. The biointerface membrane according to claim 1, wherein the second domain comprises a silicone copolymer.

28. The biointerface membrane according to claim 1, wherein the analyte comprises glucose.

29. A sensor head suitable for use in an implantable device, the sensor head comprising:

a biointerface membrane, the biointerface membrane comprising:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises

a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension; and

a second domain, wherein the second domain allows passage of an analyte, and wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes.

30. The sensor head according to claim 29, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

31. The sensor head according to claim 29, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

32. The sensor head according to claim 29, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

33. The sensor head according to claim 29, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

34. The sensor head according to claim 29, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

35. The sensor head according to claim 29, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

36. The sensor head according to claim 29, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

37. The sensor head according to claim 29, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

38. The sensor head according to claim 29, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

39. The sensor head according to claim 29, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

40. The sensor head according to claim 29, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

41. The sensor head according to claim 29, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

42. The sensor head according to claim 29, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

43. The sensor head according to claim 29, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

44. The sensor head according to claim 29, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

45. The sensor head according to claim 29, wherein the solid portion comprises silicone.

46. The sensor head according to claim 29, wherein the solid portion comprises polyurethane.

47. The sensor head according to claim 29, wherein the solid portion comprises a block copolymer.

48. The sensor head according to claim 29, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

49. The sensor head according to claim 29, wherein the second domain comprises a biostable material.

50. The sensor head according to claim 49, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

51. The sensor head according to claim 49, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

52. The sensor head according to claim 51, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

53. The sensor head according to claim 51, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

54. The sensor head according to claim 51, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

55. The sensor head according to claim 29, wherein the second domain comprises a silicone copolymer.

56. The sensor head according to claim 29, wherein the analyte comprises glucose.

57. An analyte measuring device for measuring a concentration of an analyte in a body, the device comprising:

a biointerface membrane, the biointerface membrane comprising:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension; and

a second domain, wherein the second domain allows passage of an analyte, and wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes.

58. The device according to claim 57, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

59. The device according to claim 57, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

60. The device according to claim 57, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

61. The device according to claim 57, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

62. The device according to claim 57, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

63. The device according to claim 57, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

64. The device according to claim 57, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

65. The device according to claim 57, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

66. The device according to claim 57, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

67. The device according to claim 57, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

68. The device according to claim 57, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

69. The device according to claim 57, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

70. The device according to claim 57, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

71. The device according to claim 57, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

72. The device according to claim 57, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

73. The device according to claim 57, wherein the solid portion comprises silicone.

74. The device according to claim 57, wherein the solid portion comprises polyurethane.

75. The device according to claim 57, wherein the solid portion comprises a block copolymer.

76. The device according to claim 57, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

77. The device according to claim 57, wherein the second domain comprises a biostable material.

78. The device according to claim 77, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

79. The device according to claim 77, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

80. The device according to claim 79, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

81. The device according to claim 79, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

82. The device according to claim 79, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

83. The device according to claim 57, wherein the second domain comprises a silicone copolymer.

84. The device according to claim 57, further comprising a housing and at least one sensor head, wherein the housing comprises electronic circuitry; and wherein the sensor head is operably connected to the electronic circuitry, wherein the biointerface membrane covers the sensor head.

85. The device according to claim 57, wherein the analyte measuring device comprises a glucose monitoring device.

86. An implantable glucose sensor suitable for measuring glucose in a biological fluid, the sensor comprising:

a housing and at least one sensor head, wherein the housing comprises electronic circuitry and wherein the sensor head is operably connected to the electronic circuitry, the sensor head comprising a biointerface membrane, the biointerface membrane comprising:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension; and

a second domain, wherein the second domain allows passage of glucose, and wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes.

87. The sensor according to claim 86, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

88. The sensor according to claim 86, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

89. The sensor according to claim 86, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

90. The sensor according to claim 86, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

91. The sensor according to claim 86, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

92. The sensor according to claim 86, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

93. The sensor according to claim 86, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

94. The sensor according to claim 86, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

95. The sensor according to claim 86, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

96. The sensor according to claim 86, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

97. The sensor according to claim 86, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

98. The sensor according to claim 86, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

99. The sensor according to claim 86, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

100. The sensor according to claim 86, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

101. The sensor according to claim 86, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

102. The sensor according to claim 86, wherein the solid portion comprises silicone.

103. The sensor according to claim 86, wherein the solid portion comprises polyurethane.

104. The sensor according to claim 86, wherein the solid portion comprises a block copolymer.

105. The sensor according to claim 86, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

106. The sensor according to claim 86, wherein the second domain comprises a biostable material.

107. The sensor according to claim 106, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

108. The sensor according to claim 107, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

109. The sensor according to claim 108, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

110. 444. The sensor according to claim 108, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

111. The sensor according to claim 108, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

112. The sensor according to claim 86, wherein the second domain comprises a silicone copolymer.

113. A biointerface membrane suitable for implantation in a soft tissue, the membrane comprising:

a first domain comprising a plurality of interconnected cavities and a solid portion, wherein the first domain has a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain, and wherein the plurality of interconnected cavities and the solid portion of the first domain are dimensioned and arranged to redirect fibrous tissue contracture *in vivo*, thereby interfering with barrier cell layer formation within or around the first domain; and

a second domain, the second domain allowing passage of an analyte, wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes.

114. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension.

115. The biointerface membrane according to claim 113, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

116. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

117. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

118. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

119. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

120. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

121. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

122. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

123. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

124. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

125. The biointerface membrane according to claim 113, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

126. The biointerface membrane according to claim 113, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

127. The biointerface membrane according to claim 113, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

128. The biointerface membrane according to claim 113, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

129. The biointerface membrane according to claim 113, wherein the solid portion comprises silicone.

130. The biointerface membrane according to claim 113, wherein the solid portion comprises polyurethane.

131. The biointerface membrane according to claim 113, wherein the solid portion comprises a block copolymer.

132. The biointerface membrane according to claim 113, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

133. The biointerface membrane according to claim 113, wherein the second domain comprises a biostable material.

134. The biointerface membrane according to claim 133, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

135. The biointerface membrane according to claim 134, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

136. The biointerface membrane according to claim 135, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

137. The biointerface membrane according to claim 135, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

138. The biointerface membrane according to claim 135, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

139. The biointerface membrane according to claim 113, wherein the second domain comprises a silicone copolymer.

140. The biointerface membrane according to claim 113, wherein the analyte comprises glucose.

141. A membrane suitable for implantation in a soft tissue, the membrane comprising:

a first domain, the first domain comprising a plurality of interconnected cavities and a solid portion; and

a second domain, the second domain allowing the passage of an analyte, wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes,

wherein the plurality of interconnected cavities and solid portion of the first domain are dimensioned and arranged to create a contractile force directed against the solid portion that counteracts a generally uniform downward fibrous tissue contracture caused by a foreign body response *in vivo*, thereby interfering with barrier cell layer formation proximal to the second domain.

142. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension.

143. The membrane according to claim 141, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

144. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

145. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

146. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

147. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

148. The membrane according to claim 141, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

149. The membrane according to claim 141, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

150. The membrane according to claim 141, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

151. The membrane according to claim 141, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

152. The membrane according to claim 141, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

153. The membrane according to claim 141, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

154. The membrane according to claim 141, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

155. The membrane according to claim 141, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

156. The membrane according to claim 141, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and

wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

157. The membrane according to claim 141, wherein the solid portion comprises silicone.

158. The membrane according to claim 141, wherein the solid portion comprises polyurethane.

159. The membrane according to claim 141, wherein the solid portion comprises a block copolymer.

160. The membrane according to claim 141, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

161. The membrane according to claim 141, wherein the second domain comprises a biostable material.

162. The membrane according to claim 161, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

163. The membrane according to claim 162, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

164. The membrane according to claim 163, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

165. The membrane according to claim 163, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

166. The membrane according to claim 163, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

167. The membrane according to claim 141, wherein the second domain comprises a silicone copolymer.

168. The membrane according to claim 141, wherein the analyte comprises glucose.

169. A method of monitoring an analyte level, the method comprising the steps of:

providing an implantable device configured to monitor an analyte level, the implantable device comprising a biointerface membrane, wherein the biointerface membrane comprises:

a first domain, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, wherein the plurality of interconnected cavities and solid portion of the first domain are dimensioned and arranged to create a contractile force directed against the solid portion that counteracts a generally uniform downward fibrous tissue contracture caused by a foreign body response *in vivo*, thereby interfering with barrier cell layer formation within or around the first domain; and

a second domain, the second domain allowing the passage of an analyte, wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes;

implanting the implantable device in the host; and

monitoring an analyte level.

170. The method according to claim 169, wherein the step of implanting comprises subcutaneously implanting.

171. The method according to claim 169, wherein the step of implanting comprises intramuscular implanting.

172. The method according to claim 169, wherein the step of implanting comprises intraperotoneal implanting.

173. The method according to claim 169, wherein the step of implanting comprises intrafascial implanting.

174. The method according to claim 169, wherein the step of implanting comprises implanting in an axillary region.

175. The method according to claim 169, wherein the step of implanting comprises implanting in soft tissue.

176. The method according to claim 169, wherein the solid portion comprises silicone.

177. The method according to claim 169, wherein the solid portion comprises polyurethane.

178. The method according to claim 169, wherein the solid portion comprises a block copolymer.

179. The method according to claim 169, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

180. The method according to claim 169, wherein the second domain comprises a biostable material.

181. The method according to claim 180, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

182. The method according to claim 181, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

183. The method according to claim 182, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

184. The method according to claim 182, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

185. The method according to claim 182, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

186. The method according to claim 169, wherein the second domain comprises a silicone copolymer.

187. The method according to claim 169, wherein the analyte comprises glucose.

188. A method of monitoring an analyte level, the method comprising the steps of:

providing an implantable device, the implantable device comprising a housing and at least one sensor head, the housing comprising electronic circuitry, wherein the sensor head is operably connected to the electronic circuitry, the sensor head comprising a biointerface membrane, the biointerface membrane comprising:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension; and

a second domain, the second domain allowing passage of an analyte, wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes;

implanting the implantable device in a host; and

monitoring an analyte level.

189. The method according to claim 188, wherein the step of implanting comprises subcutaneously implanting.

190. The method according to claim 188, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

191. The method according to claim 188, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

192. The method according to claim 188, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

193. The method according to claim 188, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

194. The method according to claim 188, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

195. The method according to claim 188, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

196. The method according to claim 188, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

197. The method according to claim 188, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

198. The method according to claim 188, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

199. The method according to claim 188, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

200. The method according to claim 188, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

201. The method according to claim 188, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

202. The method according to claim 188, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

203. The method according to claim 188, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

204. The method according to claim 188, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

205. The method according to claim 188, wherein the solid portion comprises silicone.

206. The method according to claim 188, wherein the solid portion comprises polyurethane.

207. The method according to claim 188, wherein the solid portion comprises a block copolymer.

208. The method according to claim 188, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

209. The method according to claim 188, wherein the second domain comprises a biostable material.

210. The method according to claim 209, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

211. The method according to claim 210, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

212. The method according to claim 211, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

213. The method according to claim 211, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

214. The method according to claim 211, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

215. The method according to claim 188, wherein the second domain comprises a silicone copolymer.

216. The method according to claim 188, wherein the analyte comprises glucose.

217. A method of measuring an analyte in a biological fluid, the method comprising:

providing an implantable device capable of accurate continuous analyte sensing, the implantable device comprising a housing and at least one sensor head, the housing comprising electronic circuitry, wherein the sensor head is operably connected to the electronic circuitry, the sensor head comprising a biointerface membrane, wherein the biointerface membrane comprises:

a first domain, wherein the first domain supports tissue ingrowth and interferes with barrier cell layer formation, wherein the first domain comprises a plurality of interconnected cavities and a solid portion, and wherein a substantial number of the cavities are greater than or equal to about 90 microns in at least one dimension;

and a second domain, the second domain allowing passage of an analyte, wherein the second domain is resistant to cellular attachment and is impermeable to cells and cell processes;

implanting the device in a host; and

measuring an analyte in a biological fluid.

218. The method according to claim 217, wherein the step of implanting comprises subcutaneously implanting.

219. The method according to claim 217, wherein the step of implanting comprises intramuscular implanting.

220. The method according to claim 217, wherein the step of implanting comprises intraperotoneal implanting.

221. The method according to claim 217, wherein the step of implanting comprises intrafascial implanting.

222. The method according to claim 217, wherein the step of implanting comprises implanting in an axillary region.

223. The method according to claim 217, wherein the step of implanting comprises implanting in soft tissue.

224. The method according to claim 217, wherein the first domain comprises a depth of greater than one cavity in three dimensions substantially throughout an entirety of the first domain.

225. The method according to claim 217, wherein the cavities and a plurality of cavity interconnections are formed in a plurality of layers having different cavity dimensions.

226. The method according to claim 217, wherein a substantial number of the cavities are greater than or equal to about 160 microns in at least one dimension.

227. The method according to claim 217, wherein a substantial number of the cavities are greater than or equal to about 220 microns in at least one dimension.

228. The method according to claim 217, wherein a substantial number of the cavities are greater than or equal to about 285 microns in at least one dimension.

229. The method according to claim 217, wherein a substantial number of the cavities are greater than or equal to about 350 microns in at least one dimension.

230. The method according to claim 217, wherein a substantial number of the cavities are greater than or equal to about 370 microns in at least one dimension.

231. The method according to claim 217, wherein a substantial number of the cavities are from about 90 microns to about 370 microns in at least one dimension.

232. The method according to claim 217, wherein a substantial number of the cavities are from about 220 microns to about 350 microns in at least one dimension.

233. The method according to claim 217, wherein a substantial number of the cavities are from about 220 microns to about 285 microns in at least one dimension.

234. The method according to claim 217, wherein a substantial number of the cavities are less than or equal to about 1000 microns in a longest dimension.

235. The method according to claim 217, wherein a substantial number of the cavities are less than or equal to about 500 microns in a longest dimension.

236. The method according to claim 217, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 5 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 2000 microns.

237. The method according to claim 217, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 1000 microns.

238. The method according to claim 217, wherein a substantial number of shortest dimensions of the solid portion are greater than or equal to about 10 microns and wherein a substantial number of longest dimensions of the solid portion are greater than or equal to about 400 microns.

239. The method according to claim 217, wherein the solid portion comprises silicone.

240. The method according to claim 217, wherein the solid portion comprises polyurethane.

241. The method according to claim 217, wherein the solid portion comprises a block copolymer.

242. The method according to claim 217, wherein the solid portion comprises a material selected from the group consisting of polytetrafluoroethylene, polyethylene-co-tetrafluoroethylene, polyolefin, polyester, and polycarbonate.

243. The method according to claim 217, wherein the second domain comprises a biostable material.

244. The method according to claim 243, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

245. The method according to claim 244, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

246. The method according to claim 245, wherein the second domain comprises greater than or equal to about 5 wt. % polyurethane and greater than or equal to about 45 wt. % polyvinylpyrrolidone.

247. The method according to claim 245, wherein the second domain comprises greater than or equal to about 20 wt. % polyurethane and greater than or equal to about 35 wt. % polyvinylpyrrolidone.

248. The method according to claim 245, wherein the second domain comprises polyurethane and about 27 wt. % polyvinylpyrrolidone.

249. The method according to claim 217, wherein the second domain comprises a silicone copolymer.

250. The method according to claim 217, wherein the analyte comprises glucose.